

CLAIMS

1. A transmitting device, comprising:

5 a continuous pulse generating unit that continuously generates a plurality of impulse waveforms at arbitrary time intervals but shorter than a pulse string repetition cycle;

a modulating unit that modulates a continuous pulse generated by the continuous pulse generating unit, using transmission data; and

10 an output unit that outputs a pulse modulated by the modulating unit.

2. The transmitting device as claimed in claim 1, wherein a pulse interval of a plurality of impulse waveforms generated by the continuous pulse generating unit is set shorter than a pulse width of the plurality of impulse waveforms generated by the continuous pulse
15 generating unit.

3. The transmitting device as claimed in claim 1, wherein the continuous pulse generating unit has at least one of rising delay and
20 falling delay in the impulse waveform generated.

4. The transmitting device as claimed in claim 1, further comprising a frequency converting unit that converts a frequency of a pulse modulated by the modulating unit, wherein

25 a frequency to be converted by the frequency converting unit is arbitrarily selectable; and

the output unit outputs a modulated pulse after being converted

by the frequency converting unit.

5. The transmitting device as claimed in claim 1, further comprising a frequency converting unit that converts a frequency of a continuous pulse generated by the continuous pulse generating unit, wherein

a frequency to be converted by the frequency converting unit is arbitrarily selectable; and

the modulating unit modulates a continuous pulse after being converted by the frequency converting unit.

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6. The transmitting device as claimed in claim 1, wherein a power level of an impulse waveform generated by the continuous pulse generating unit is arbitrarily settable.

- 15 7. The transmitting device as claimed in claim 1, wherein the continuous pulse generating unit outputs a plurality of impulse waveforms only for a specific transmission data signal.

8. A receiving device comprising:

- 20 a modulated pulse receiving unit that receives a modulated pulse transmitted from any one of the transmitting devices as claimed in claim 1 through claim 7; and

- a demodulating unit that receives transmission data by demodulating a modulated pulse received by the modulated pulse receiving unit.
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9. A receiving device comprising:

a modulated pulse receiving unit that receives modulated pulses that are continuous pulses modulated using transmission data and transmitted, the continuous pulses that are a plurality of impulse waveforms continuously generated by a transmitting device at
5 arbitrary time intervals but shorter than a pulse string repetition cycle; and

a demodulating unit that receives transmission data by demodulating a modulated pulse received by the modulated pulse receiving unit, wherein the demodulating unit demodulates a signal
10 that is a group of a plurality of continuous impulse waveforms pulse-phase modulated, and wherein the receiving device judges a change in phase of a second pulse or later with reference to a first pulse.

15 10. A receiving device comprising:

a modulated pulse receiving unit that receives modulated pulses that are continuous pulses modulated using transmission data and transmitted, the continuous pulses that are a plurality of impulse waveforms continuously generated by a transmitting device at
20 arbitrary time intervals but shorter than a pulse string repetition cycle; and

a demodulating unit that receives transmission data by demodulating a modulated pulse received by the modulated pulse receiving unit, wherein the demodulating unit demodulates a signal
25 that is a group of a plurality of continuous impulse waveforms pulse-amplitude modulated, and wherein the receiving device judges a size of amplitudes of a second pulse or later with reference to a first

pulse.

11. A receiving device comprising:

a modulated pulse receiving unit that receives modulated pulses
5 that are continuous pulses modulated using transmission data and
transmitted, the continuous pulses that are a plurality of impulse
waveforms continuously generated by a transmitting device at
arbitrary time intervals but shorter than a pulse string repetition
cycle; and
10 a demodulating unit that receives transmission data by
demodulating a modulated pulse received by the modulated pulse
receiving unit, wherein the demodulating unit demodulates a signal
that is a group of a plurality of continuous impulse waveforms
pulse-position modulated, and wherein the receiving device judges a
15 change in position of a second pulse or later with reference to a first
pulse.

12. The transmitting device as claimed in claim 1, further comprising a
single pulse transmitting unit that generates a single pulse,
20 pulse-position modulates the single pulse using the transmission data,
and outputs the single pulse, wherein continuous pulses generated by
the continuous pulse generating unit are a plurality of pulses with
different phases continued, and wherein the modulating unit does not
modulate the continuous pulses generated by the continuous pulse
25 generating unit but inputs to the output unit.

13. The transmitting device as claimed in claim 12, wherein both a

pulse-position modulated signal supplied from the single pulse transmitting unit and the continuous pulses are changed in position as appropriate for same arbitrary time.

- 5 14. A receiving device that receives a signal transmitted from the transmitting device as claimed in one of claim 12 and claim 13, comprising:

a two-signal receiving unit that receives a pulse-position modulated signal supplied from the single pulse transmitting unit and
10 the continuous signal; and

a correlation judgment unit that judges information by converting a correlation signal to signals with different phases, positive and negative, according to a pulse position, by multiplying the two signals received by the two-signal receiving unit.

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15. A communication system comprising:

the transmitting device as claimed in any one of claim 1 through claim 7; and

the receiving device as claimed in any one of claim 8 through
20 claim 11.

16. A communication system comprising:

the transmitting device as claimed in any one of claim 12 and claim 13; and

25 the receiving device as claimed in claim 14.